# ATLATIC INTERNATIONAL UNIVERSITY

**1. Circulum design format offline.**
**-Name : tshingombe Tshitadi**

**-course title| course objectives|| course description||| activity to carry out |||| ID source of date ||||| bibliography.**
**-**

| cours e title | course objectiv | course descripti | activit y to | ID sourc | ibliograp hy | | |
|---|---|---|---|---|---|---|---|

| | es | on | carry out | e of | | | |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |

**1- Proposal of thesis content / final project**
**Content**
1 .name of thesis
2.index
3. Introduction.
4.description .

5.general.analizing
6.current information .
7.discussion
8 conclusion.
9. Bibliography.

_____
**1.Name of thesis** : implementation and framework national qualification and national trade examination circulum experimental job theoretical pratical college and government policy LMS  in engineering studies science electrical businesses module: case studies rsa  in dhet,saqa , St peace college
**2. Index**:  topic  achieve research advance field basic field , essential filling research  circulum, fundation intermediate,elementaire
3.Introduction : the core and research advanced field experience of sciences engineering electrical study and implement programme in social education and industrial trade vocational career  productu sector in energy electrical and science engineering field system need to learn and re implement system information management system sector  opportunity and through activities investment horizontal creation of equitable distribution: transformer science engineering and electrical product method learn capacity generative intelligence systems of linear regression models machine learning model for specific results reported that they haveA Mon other aspirations Isreal parameter real power factor and Imagineer power factor ,, need to resolved system exper and artificial intelligence system rural development system residential dispatch deployment system and framework qualification mean regulation humain resource and material work trade design career center to make system LMS factor adaptation between robot science trade elementary work trainer training phase products and systems industrial generator entrepreneurs in same order phase assessment news field and compensation.problem ask rural development need new training order framework to qualicafition requested requalification redesign equivalents system , occupation framework system between national framework qualifications instituts and national trading sector licensed theory and practical in nature and creative abilities,
-typical evry country or landscape will be in a constant state of design system in ,,,,
Large  measure unpredictable and this city or village at different paint of time ,, implementation the Grove years of failed turound ..
4**.desceiption :at the heart of solutions to framework qualicafition and national trade** implementation sub sector training trainer experiemental work place industrial more student and instituts college trade years external internal work value increase price macro economics instability Crete ,.sice accentuated by advertising shortage high inflation levek rising unemployment capacity industrial trademarks society system and materials adequately support trade training QMS system information commissioner,to under utilities in the address desterious policy design

implementation ,

**5. General analysis: in order to break the  successful it has become social contract principle in**

**-6 current information**:

In working to formatted a trade framework qualicafition and national framework and career skill sector trade seta in same system in order to resolve problem impact real to dispatch electrical system real ,work trade design

 For the turnaround ,the following
- objective.
- the diagnosis the fundamental strategies instituts framework qualicafition national equivalent national trade international sector approval occupation council trade council engineering sector portal career design to synchronise system adaptative sector LMS learner engineering competition grade post senior principal, engineering electrical ,tradesman wire ,cadet minim system up date successful system in design grade operational, framework award qualifition research undertake material test week conductor atom technical engineering innovation learn teach research mark method marks need to implement adaptative system , research topics circulum regulation irregularity material script, backlog system , combination system ,printer and system need to make synchronise system deploy generative job framework undercover job in next generation must going

- to discern and isolate the sicio economic environment engineering system trade safety security police , commissioner trade need to meet requirements qualicafition framework and the framework must also show in the social successful but framework it increases by outage loadshedding and social down to declined empirical experiemental in other contemporary ,the regret filled job no successful for time table printer system or computers system experiemental make design advanced research ,
-7. discussion the objective is to explore that strategies and situation where Rapide performance import. Trade theory..
- conclusion:
Whilst the field of strategy has be explored extensively in vast   to trade framework qualifications need to requalification system was temporarily qualify  expire system in job work sector training and regulations system industrial system need cpd to continue system and subject short and gate

more skill job was slow operational field basic in basic was poorly no attandance system advance essential field job make support frame commissioner no meeting system trade retrade was not in the same ways Orders orientation industrial, imperative hard, largely ,the research interest and how a fruit full common,ground can be established.
- one of the critical virtues of the proposal thesis that it  Engineering electrical science make in order to  stabilize thought transfer the vei ld consensus building in ,,
- the thesis is ,, model design
Policy commissioner vs learn vs teacher vs ,, framework national trade vs company property intellectuel business electrical system need to meeting...wrong model design topic ,, research rural energy design framework , and orientation system  learner teach career mentor  faciltor purpose framework,leaver school need to meeting,
Design two g city design systeme economic revenue bank system portal need sector trade to work in place electrical designer b Poste trade  case research job workplace resulted was recruited need printer pool position rank no waiting

- 8 bibliography:
- tshingombe 2023_2924 < Poe's published,,educ technology, magazine net database, St peace  college.
Record book completed
- web TVET dhet ,saqa wab
- alu

_____
Graduation procedure form . congratulations programme , diploma .
-1 data verification.
- grade | description| point | numeracy

2

-2. Basic questionnaire exam test
Class

_____
AIU .

-Academic evaluation questionnaire , videoconference:
-A.I.U|education|| domination|||emphasis|||| specifications||||| professional.

_____

3.curculum course ,
Assessment
-3.1.title of the subject :
 engineering electrical master
-3 2 terminanal objective of the course :
Engineering electrical master  basic advance field studies assignment to able capable to define to design  creativity fundamental system master low skills and knowledge value compete with each section shall be responsible for delivering the best regards in electrostatic electrodynamics electromagnetic and value of power systems.
- 3.3..brief description : the course electrical power system use or business in trade theory pratical system to master system value more stability of movement quantum mechanics transformation of electrostatic dynamic low stability,relativity of charge celerity basic and advance in trade theory electrical low Commissioning and approval: low change rules change phenomenon fundamental by stress of movement rupture breaking electrical system synchronise system asynchronous linearization system,in trade theory electrical and industrial electronics basic advance power
3.4.synopsis  of content: the stability design projection system trade marketing board information system electrokinematic dynamic physical state engineering science introduction used to trade theory electrical ,manufacture process inventory low stamp  system low stable loadshedding week manufacture industrial technology linearization system.
-3.5 activities of course :
Activity engineering electrical electrical experiemental subject completed log Engineering studies work 3dimension multidisciplinary approach logic of this claim: information management system in education and learn trade facilitation
Discussion log : completed theory pratical physic experiemental panel trade ,, experiemental input and output system
Activity: manipulation: test electrostatic
Conductivity expension linearization system ,dynamic system test insulation conductivity low rules , derivatives limited integrally sum resulted test system evaluation framework.
Critical source
3.5 .source of data :
Experiemental topics St peace college tshingombe ,web PG
3.6 bibliography:
Tshingombe .

_____

4.Assignment :
Title  page: engineering electrical master

Electrostatic electrokinematic electrodynamics electromagnetic, stability power systems ,,,process control ,,in trade theory pratical manufacture process. Inventory claim
- index :
- page :
Cover the ,7 basic
Question course
Wath means
- diagrams: scheme correlative matrices and comparative matrices :
Answer:
- deepening of the subject : engineering electrical master low phenomenology studies vibration system.
- pratical example and cases .: engineering electrical cases study city power scheneider Eskom. Loadshedding power and industrial dtic trade career hr

- justification:

- level experience :

- how the treated subject is seen at the local regional
-advantage and disadvantages,.
Poor efficiency and poor distribution of system ,, in trade close tendered system
Big system most important consumers system in trade increase coat award ..

No master number real system imaging

_____

5. Topics.
Table of contents:
5.1: Introduction purpose of topics
Definition rationale:
5.2 description:
Components of the topics
5.3.general analyse :
- 5.4. actualization : case study.
5.5 . discussion:
5.6 general recommendation .
5.7 : suggestions.
Conclusion news perspective

- 6 topics in electrical engineering,MS ,MSEE..

- topic 6.1: digital telephonic
Introduction purpose  of definition

- topic 6.2: space  control system.

- topic 6.3 . advanced telecommunication.
-topic 6.4: wireless telecommunications systems.
- topic 6.5: neural networks.
-topic 6.6:  computation and biologic
-topic 6.7: knowledge base system in electrical.
- topic 6.8: principle of internetworking.
- topics 6.9: optical fibre ,
- topics 6.10: signal detection and estimation theory .
- topics 6.11: digital control system.
Topics 6.12 microprocess system .
- topics 6.13 introduction to stochastic process : movement aleatoi ,signal redresseur assessvisa system band etroite , signal note .
-topic6,14 optical and ultrasound ,tomographic ,,supersoun u

Propagation linear celerity movement incidence ..
Topic : 6:15 industrial power systems process ,,
Signal input output functions power
Topics : 6:16 . signal detection and estimation theory digital images reconstruction and medical imagine
- topic 6:17, process integration
- topics 6;18.parallels computer architecture .
Topic.6:19.  architecture computer
-
Topic 6:20 . power systems control stability.
Topic 6.21: electromagnetic
Topic 6,22 mathematics ,statistic probability,, calculus ,,binary
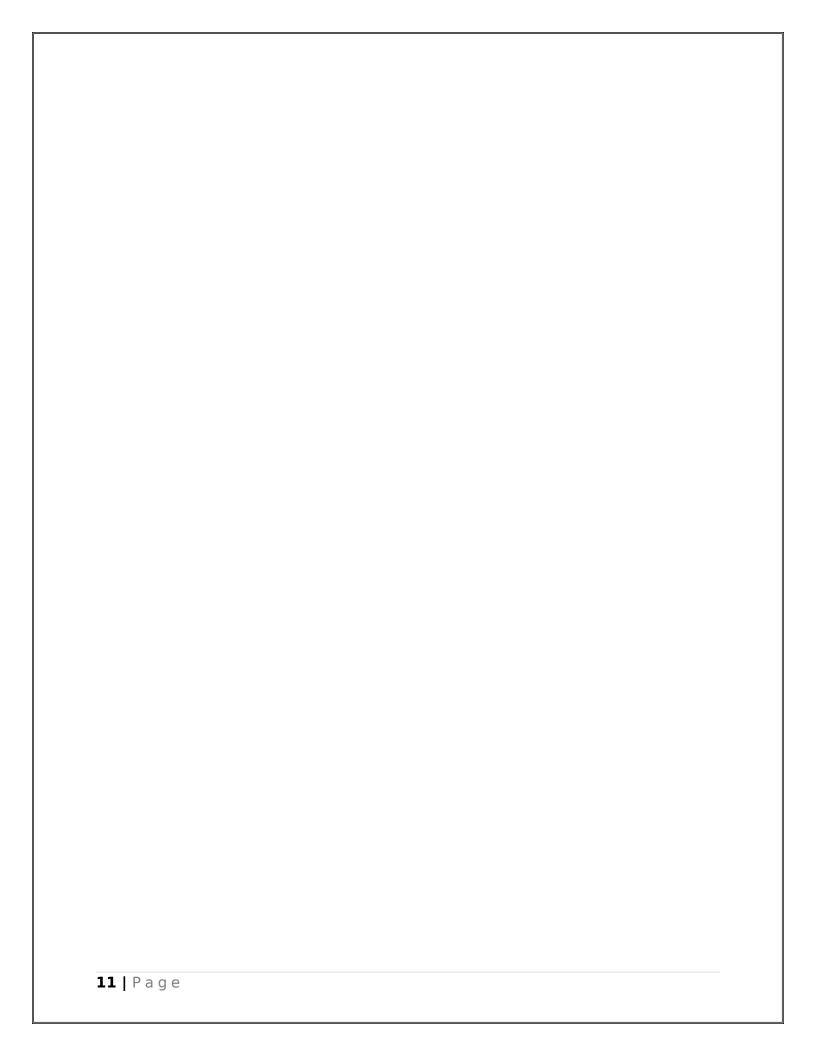Physic ,..

_____

Orientation course.
- topics 6:22.communicatiin , investigation comphrensive
- topics6:23.. organization's theory Portofilio
-topics  6.24. experiemental learning , autobiography.
- topic 6.25 ,academic questions evaluation evaluation .
- topic ,6,25 fundamental of knowledge integration.
- topics fundamental principles phylosophie education.
- professional evaluation development evaluation
- development of graduation studiy
Master skill development long

 approfondis kinematics system phase transition phase education system specialist personal care education facilities,, phenomenon city

Topic

. Topics.
Table of contents:
5.1: Introduction purpose of topics
Definition rationale:
5.2 description:
Components of the topics
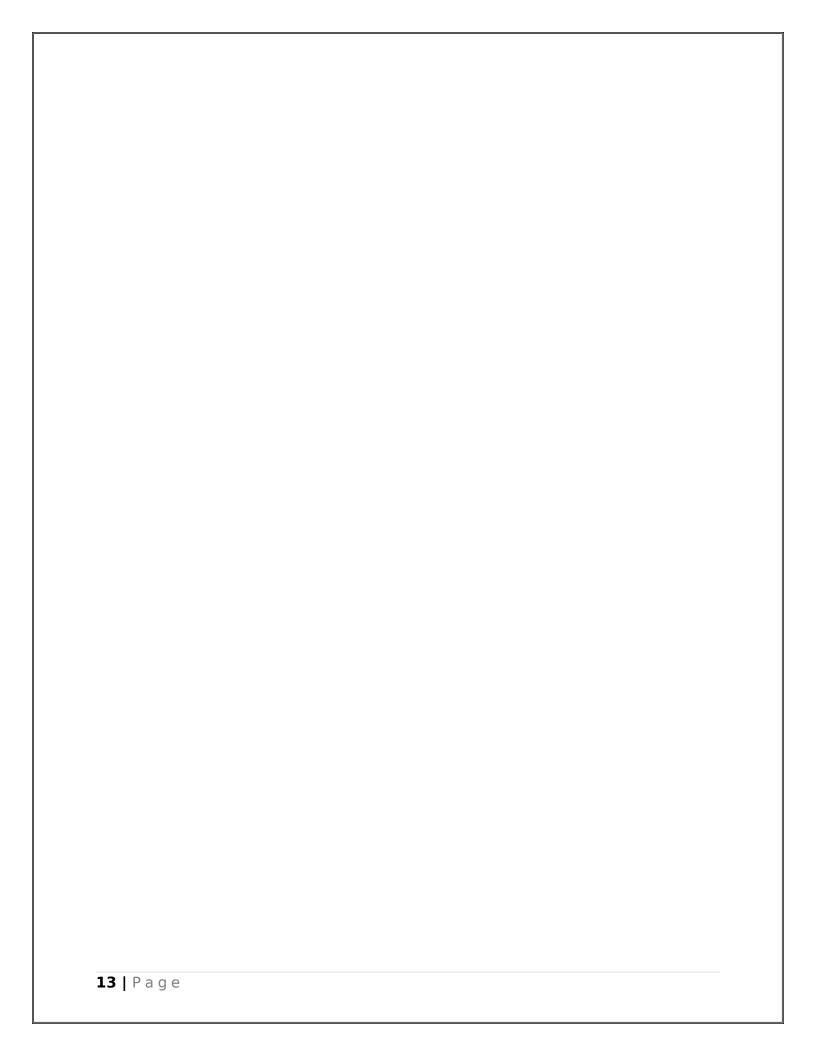5.3.general analyse :
- 5.4. actualization : case study.
5.5 . discussion:
5.6 general recommendation .
5.7 : suggestions.
Conclusion news perspective

3 of 976

**1.thesis research in electrical engineering.**
**-*1.1.overview : conducting thesis research in electrical engineering typically involves identifying a specific problem or area of interest within the field conducting.**
**Experiemental,or simulation and analysing risk.**
**\*1.2. Key topic: possible research area could include power systems control system.**
**_____**
**Telecommunication,or embedded systems your thesis contribute new knowledge or soluyto existing challenge in the electrical and electronics.**
**\*1.3.trade theory in electrical electronics.**
**\*1.4: overview this involves understanding** principle and electronics relate to electrical and electronics system installation, maintenance and safety.

*1.4. topics : you might study electrical code circuit design ,and troubleshooting technique this knowledge is essential for ensuring safety safe and  efficient electrical installation in variouse..

*1.5 . advantage  and disadvantage trade theory in electrical engineering.

* Innovation and development trade theory encourage competition which can lead to innovation and development of new technologies In countries to specialise in the production of certain electrical good loading to more efficient use of resources.

- economic growth: engagement in international trade can boaf economic growth by expanding market for electrical.

- knowledge transfer : trade can facilitate the the exchange of knowledge transfer trade can facilitate the exchange of knowledge and technology between countries, enhance the overall capabilities..

- disadvantages:

1.6. dependency: countries may become overly dependent on imported electrical good which can be risky if supply chain are disrupted .

-1.7.. trade theory in electrical engineering.

* Overview trade theory in electrical engineering often refer to the principles and practices related to the electrical trade : including , installation maintenance and , safety standards.

-irregularity in material design THR's could refer to issue related to the consistency and ,quality of material used in electrical .

- application , understanding how to identify and address irregularity in material is crucial for ensuring safety and performance in electrical

1.8. backlog issues:

- *overview: in the context of engineering and project management backlog issue refer to delay or outstanding task that need to beadress occured in

variouse stage of a project from design to implementation ,
-1.9. key considerations: addressing backlog issues, often involves analizing task ,and efficiently this is crucial for maintenance project to timeline and ensuring successful.
-key topics : electrical : calculation understanding how to perform calculation related electrical .
System, including loaf calculation voltage. Drop and circuit design.
- Power supply system : learning about different types of power supply system , including ,AC and DC system transformers and and distribution.

_____
-2. Interested in Educational technology can impact the outcomes of manufacturing topics in electrical engineering Engineering.
2.1 simulation software: tools like MATLAB and Simulink allow students to model and simulation electrical ,system ,students to model and simulate electrical , system helping them understand complex concepts without the need for physical prototype.
* Online learning platform these platforms provide access to a wealth of resources including video lecture interactive quizzes and forum for discussion making easier for student to learn at their .
* Collaborative tools : technologie like cloud based . collaboration platform allow students to work together projects and instructor enhythr system taillor Education content to the individual need of students helping them grasp difficult concept ,in manufacturing and electrical engineering more.
- *industry parterneship: collaboration with industry can provide students with real world project and case studies bridging the gap between theoretical knowledge and practical application in manufacture.
- lab workshop electrical engineering .
1.circuit design and analysis ,student design and analyse various electrical circuits using bread board, simulation software.
2.microconyroller programming: workshop include.progtamming microct , ( like Arduino or raspberry control device and sensor.
3.Powe system: experiemental,may involve studying power generation transmission and distribution including renewable energy source .
4.conyrol system ,student learning about feedback system.ans controle theory through pratical application and simulation.
5. Electronics prototyping : workshop may focus on building prototype of electronic devices,allowing students to apply their knowledge in real - word scenario.
6. Testing and measurement student learn to used various testing equipment such as oscilloscope and multimeter,to measure electrical parameter.
- telecommunication, workshop may cover topics like signal processing and communication system in

3. Workshop lab: aspect of trade e in electrical engineering trade theory often involves the pratical application of theoretical concept in a workshop settings.

*1. Fundamentals of electrical theory , understanding ohm low ,Kirchhoff's low and other foundation principle that government electrical circuit.

*2. Hands - on circuit assembly , student typically engagement assembling and testing various electrical circuits applying theoretical knowledge to practical scenario.

3.troubleshooting technique , workshop often include exercise diagnosis and fixing uses in electrical system , which is crucial.

4.safety practice : emphasising safety protocol when working with electrical components and systems is vital part of any workshop.

5.usr of tools and equipment familiarisation with tools such as multimeter , oscilloscope and soldet equipment ,which are essential for electrical engineering task .

6.project based learning ,student may work on specify project that requires them to apply traditional theory concepts such a designing a simple electrical device or system .

7. Collaboration and teamwork , encourage

-information on workshop lab that cover trademarks panel wiring electrical switch one way and two ,way relay motor .

- panel wiring : basic of panel wiring learning how to wire electrical panel including understanding circuit diagrams and layout planning.

* One-way switches hands- on practice with one - way switch which control a ligth or device from a single location.

* Two way switch work with two way switch that allows control of a ligth or Devuce from two different hallways or large room.

* Relay motor ,AC and DC motor understanding the difference between AC ( DC ,) motor their application and characteristics relay operational , learning how relay work ,their in controlling motor and other device , students may practice wiring relay to control ,AC and DC motors,

- practical application : hands - on project that involves wiring circuit with one way and two way switch integrating.

_____
6.Lab : workshop,

1. Industrial electronics.

* Overview of industrial systems:
Understanding the component and systeme used industrial electronics including sensor.actuor and controle systeme.

. installation practices : learning best practices for installation electronics system in industrial settings , including wiring ,mounting and configuration.

2.*Computer installation: hardware setup hands on experience with installing computer hardware compagny including matherboard ,power supplies and peripheral.

* Software installation: understand the process of installing operating system and necessary software for computer system.
* Safety rules : electrical safety emphasising the importance of safety protocol when when working electrical system.
- including proper use of personal protective , equipment ,( PPE) and safety handling of tools .
* Compliance with standard , learning about industrial.
* ,4 . fault finding technique , troubleshooting teach systeme Pproach diagnosing the use of flowchart.fault in electronics system including the use of flowchart and checklist ,use of diagnostic tools familiarisation with tools such as multimeter oscilloscope and tester to identify and analyse fault.
- 1* high voltage safety , safety protocol.emphasising the importance of safety when working with high voltage system including the used of personal protective equipment PPE and understanding hazard.
* Emergency procedures , training response procedure incase of electrical accidents or equipment failure.
* Power generation : type of power generation exploration various methods of power generation includ thermal hydroelectric ,wind  and solar power .
* Generation , equipment hand on experience with generator, transformer and other equipment used in power generation.
3. Transmission :  line design understanding the design operation of high voltage transmission line . including factor affecting.
- efficiency and reliability.
Substation operation learning,about the role of substation in the transmission system , including switching,protection .
4. Engineering trademarks, standards and certification , familiarisation with industry standard and trademarks related to high voltage equipment and systems , IEEE,IEX,ANSI,,
-Quality assurance: understanding the importance to ensure safety reliability and performance in power systems.

_____
Manufacturing process of electrical components.
1. Design and prototyping.
- concept development engineer design the electrical components consideration functionality material and specifications.
- prototyping:  is created to test the design and functionality before mass production.
2.*material selection choosing material select material: selecting appropriate material based on electrical thermal ,and mechanical properties common material including metal , plastered and ceramic ..
3* fabrication , machining : cutting drilling and shsppings material to create the component parts ,
* Molding : for plastic components , injection molding often used to create complex shapes.
4* assembly : components assembly : parts are assembled together ,which may include soldering welding or using adhesive components like resistor

capacitor and microcontroller into the assembly.

5.motoring electrical vehicles.
*5.1 overview: this area focus on the design development and operations of electric vehicle ( EVS ) and their components . including electric motor , batteries and chargers system.
- *5.2. key topic : you might explore electric motor design battery technology power electronics and vehicle dynamics understanding the integration of renewable energy source and renewable energy.
-*5.3 . substation: overview , substation are design protection system design protection system, controle and maintenance practice , understanding the role substy in smart grid technology and renewable energy integration,is .

* 5.4 .  Nanotechnology:
*5.5 overview: involved manipulating matter at the nanoscale billion of meter to create material and devices with unique properties field has application across various industries electronics medicine and in the context of electrical engineering study nanoscale component as transistor sensor and energy storage devices nanotechnology enhance ,perfy .

5.6 cellular components :
5.6.1  overview this refer to the study of t structure and function of cells structures on function cell which are the basic application in biotechnology and cellular signak memoire brand dynamic and role of protein and nuclei acids.
5.6.1 azure and machine learning Microsoft Azure is a cloud computing platform that provides a wide range of services including machine learning data storage and development to buit deployment and application machine development to build deployment and application machine python use task such as analysing medical .
*5.6.2. Assess moderator :
* Overview is responsible for overseeing and ensuring the quality and fairness of assessment in Education settings this role often involves evaluation effectiveness .
* Key topics: focus on asssessment evaluation effect.
*Key topic : focus an assessment evaluation criteria and best practices for ensuring reliability and validity in testing.
* 5.6.3. Education,didactic :
* overview : didactic in the science of teaching and learning it involved understanding how to effectively learning experience.
* Key topics: study instruction design curriculum development and teaching strategies ,styles .

5.6.4. psychopedagogy ,
*Overview: this field combines psychology to understand how psychological principle can be applied to Education practice ..
.5.6.5.: role is some who guide and supporter ,a group or individual in achieving their goals often in Educational or professional setting this role involves creating learning collaboration.
*Key skill : effective commy ,active listening conflict resolution and the ability to faster engagement skill for a facilitation .

*5.6.6 Personality care in montesory:
-overview: education setting per .
- care focuses on nurturing the individual child's development including their emotional.
* Key principles: Montessori educy emphasising respect for the child fastening independent and creating a supportive environment that encourages exploration a supportive environment that exploration and self directed learning personality care involves understanding each childs..

*6.1 Marine Engineering overview marine engineering focused construction and maintenance of ships boats and other marine vessel combined with electrical engineering it involves the electrical system that power and control .- key topics : in this field marine propulsion system electrical power generation and t ontrok system for navigation and automation engineering.
- key topics in this field marine propulsion system electrical power navigation and automation engineering.
- key topics: in this field you might study field you study marine propulsion electrical power generation and distribution control system for navigation and automation and safety systems marine systems marine electrical engineering ensure that the electrical system on vessel are efficient reliable and compliant with maritime.

- 6.2. labour  machinery low.
* Overview : this area focuses on the legal regulation standards governing the use of machinery in the workplace safety ,labour rights and operationel standards.
* Key topics: you  might study occupation safety.regulation machine stardard and compliance understanding low is crucial for ensuring , environment.and protecting workers .
*6.3. Bargaining:
*Overview bargaining typically refers to the negotiations process between employer workings conditions wage and other.
- key topics : you might explore collective bargaining agreement negotiation strategies and labour relations under.dynamic of bargaining is essential for mastering positive workplace.

* How to make a self assessment ,exam creating a self , assessment exam

can help you evaluation your understanding of biophysics engineering concept.

1. Identify key topics, list the main topics concept you want to assess for biophysics engineering area like biomechanics medical.

2.create questions : development variety of questions types multiple choice provide several optt for each question true false simple statement that the responsibility must .

- identify as true or false.

* _____

-6.4 marking topics for electrical assignment exam Portofilio.

- preparing your Portofolio for an electronical assignment exam .

1.select relevant topics : choose topics that Lign with the course objectives and your interest the could area like circuit design power systems control power or renewable energy.

- organisation : your work structure your Portofolio logically you might include section for.

* Introduction :

*Of the topics  cover.

* Projection: detailed description of project you  completed including objective methods.

* Assignment: including key assignment that demonstrates your understanding of the material..

_____

7.1 .Sorting and counting learning about the mechanism that allowed these machines to sort and count bank note efficiently involves understanding the sensor and algorithm used to detect different denomination and conditions of note ,new worn or damages.

-quality controle exploring how bank note processing machine ensure that only acceptable note are circulate, removal of counterfeit or damaged not are circulate removal of counterfeit on damaged notes from.

- integration with banking system gaining knowledge integrate with bank systeme for invatory management cash flow analysis and reporting.

- maintenance and trout , understanding maintenance requirements and common issue that can arise .

- with banknoy processing machine ,.

_____ '''

- 7.2 chemical engineering engineering and science are distinct yet interconnected field with engineering that focuses chemical engineering.

*Overview: this field involve the design optimization and operations of process that convert row material into valuable product chemical fuels pharmaceutical and dad,

*You might study thermodynamics , reaction engineering ,process design and separation process chemical engineering also focus on safety sustainability environment impose

___

7.3.  physics engineering:.- overview physic t applies principle of physic development new technology and solve engineering problem.often overlap with field like electrical mechanical and materials science.
- key topic: explore topics electromagnetic thermodynamics and quantum physics engineering work project involving.
.- science engineering.
* Overview : is Broder term that can encompasses various engineering disct that apply science principle to solve pratical problt include interdisciplinary approach .
* Key topics on focus study area science biomedical engineering often work on research and project requirements a strong foundation.

-7.4.biophysical Engineering is an interdit field that combines principles of physic biolt and enito understand and development technologie related to .
- biomaterials: understanding the properties and applications of material used in medical device implants and tissue engineering this include studying how these materials interact with biological.
* Biomechanics: learning about the mechanical principle govern biological systems including the movement of organism and the force acting on biology tissue this knowledge is crucy for designing .
- medical imaging exploring technologie used.
- biological structure and functt MRI ,CT and ultrasound ,physic being imagi technique and theirs application in medicine.
- bioinformatics: gaining knowledge in the the computational tools and techniques used to analyse biological data including genetic  sequence and protein structure this is essential for understanding complex brigicak system ,systeme biology understanding how biological systems functionalite as interaction between genes ,protein metabolism pathways  this knowledge can infot the design of targeted therapies and biotechnological application

-7.9.  biophysical engineering and total productive maintenance ,tpm are important concepts in the field .
1.biophyscal engineering:
- overview: this interdisciplinary field combines principles of biological physics and engineering to develop technologie and process that improve healthcare and bioloy design of medical device biomaterials and bioprocesses .
-key topics : you might study area a biomechanics bioinformatics medical imat and tissues engineering physical Engineering work on project that involve the application of physic principle to biologist system ,such as developing prosthesis ..

- 9.10. total productive maintenance ( tpm )
* Overview: tpm is a maintenance philosophy aimed at maximizing the productivity of equipment by minimising downtime and ensui that machines

operate at peak efficiy .it involve all employee in the maintenance process ,from a operator to manai

*- key topics : explore concepts such as automouse maintenance ,planned maintenance and continuous improvements ,tpm ,focuses on proactive maintenance strategies including regular inspection preventive maintenance..

_____

* 10.  Relavtiviy ,

* Overview : relativity primarily associated with Albert Einstein include the theories of soeciat relativity and general relativity thesis theories revolutionised our understanding of space time ,and gravity .

- key topics : in engit you might study the implicai of relativity in field like astrophysics GPS techent and high speed particle physic  , understanding relativity is crucial for application involve high velocities or strong gravitational.

- hydraulic and pneumatic system uses liquid,while pneumatic uses gases both system are widt used in industrial applications machinery and automation.

- key topics: you might study fluid mechanics system design control system and the component.

-9.1 simulation and modelling gaining in simulating control system to analyse their performance and Optimizer their design .

- 9.1.1.satellite communication understanding the principles of satellite communication system including hour satellite transmitted and ret signals the different types of satellite geostationary low earth arbitrary application in broadcasting.

-9.1.2. fiver optic technology learning about fiver optic communication uses light to transmit data over long distances with minimal loss you studies installation.

- 9.1.3.integration of techniques exploring how satellite and fibre optic technologie , exploring how satellite and fibre optic technologies can be integrated to provide comprehensive communication solution such as using satellites for connection in remote areas where .

-9.1.4. network design and Optimizer communication network utlize both satellite and fibre optic technologie data transmission and connectivity .

- 9.1.5 energy electro energies ,likely ref various forms of electrical energy their application in .

- *to electro energy systems . understanding the generator energy includes studying power plants , renewable energy source , like solar ,winds hydro and the electrical .

9.1.6 .energy conversion. Learning about the process involves in converting

different form of energy mechanical thermal chemical. Into electrical energy and this includes studying devices like generator motor .
- *energy efficiency .exploring method .
- energy efficiency exploring method to improve the efficiency of electrical energy use in various applications including industrial processes.
* Smart grids gaining knowledge in the device management of smart grid technologies that enhances reliability and efficiency.
* Network engineering how to design efficiency and cable network including local area network LANs wide area network ,Wan's and cloud network,you learn about network topologies protocols ,and architecture.
-*network security , learning about the principles of security studying firewalls ,instrusion  detection system and encryption.
-*network management gaming skill in managing and monitoring network performance , including troubleshooting issue optimizig traffic flow and ensi reliability.
- emerging technologies exploring new trend in network software ,
- definitely networks (SDN) , network functionalite virtualisation ( NFV) and the internet of things .
*Certification and standards: familiart yourself with industry standard ,/ certification such .
- certificate network associate ,( CCNA ) or competition network which can enhance your career.
-;electrical trade theory is an essential aspect of electrical of engineering and vocational training that focuses on the principles , practice and standard related to electrical work .
* Fundamentals principal understanding the basic concept of electricity including ohm s low Kirchhoff's low,and other principle of circuits ,voltage current and resistance.
* Electrical code and standards learning about the regulation and stars that govern electrical installation and safety practices such national electrical code ,(NEC) local building.
* Installation practices gaining knowledge in the proper technique for installing electrical systems including wiring circuit breakers outlets and ligthning fixture while ensuring compliance safety standards.
* Troubleshooting and maintenance developing skills in diagnosing and repairing electrical issues including understanding common problem and implementation effective solution.
* Safety practices , emphasising the importance of safety in electrical work practice and understand electrical hazard, instruments measurements and controle in electrical engineering is a critical reaction focused on teachiques and tools used to measure and control electrical ..
- Measurements techniques technique understand various for measuring electrical quantities such as voltage current resistance power and energy this include multimeter oscilloscope and power analyser .
- control systems . learning about the about the principles of control system, including loops control algorithm and systeme stability to design and

implementation control systems to regulate electrical process.
* Sensors and transducer ,: exploring the type of sensor and transducer used to convert physical quantities.
- temperature , pressure and flow into electrical signal  for application.
- data acquisition system,gaming knowledge in the designated and implementation of data acquisition system that collected and analizing data from various sensor and instruments for monitoring and control purposes.
- automation  and  process control understanding how, measurements controle systeme are Applied in industrial automation including programmable logic controller ,PLC and supervisory control and data acquisition , SCADA..

* 10. Banknote processing machines specialized device used in  the banking and financial store to handle ,.. in the banking sector to handle sort.

*Currency authentication understanding the technologie used in bank note processing machines to verify the authenticity of currency note ,this includes features like ultraviolet ,UK ligth detection magnetic character recognise and infrared IR , scanning.

10.1 telecommunication systems understanding the principles of communication system signal processing and networking design .
- Power systeme learning about the generation transmission and distribution of electrical power as well as renewable energy sources.
10.2 .neural ,
* Medical imaging using neural neural networks for image analysis in MRI ,CT scans and  x- rays it improves diagnostic.
* Predictive analytics : developing model to predict patient outcomes or disease progression base on medical data

*10.3 Wearable technology : integrating neural networks into devices that monitor health metrics in real time .
* 10.4. Mathematics : advanced topics such as linear algebra calculus differential equations and status which are essential for modelling and solving Engineering problem .
*10.4.1.  Physics : concept related to electromagnetic circuit theory and signal processing which or .circuciak understanding electrical systeand their applications.
-10.4.2andragogy focused on the methods and principle used in adult educay emphasising the unique need of adult contest of your master program understanding andragie help you design effive learning experience.
-10.4.3 educational philosophy involves the study of the fundamental naturel and purpose of education it can guide your approach to learning and teaching help your approach to learning and teaching help you to develop a personal philosophy that design with your goal in Engineering Education.
*10.4.5Professional theory this include the ethical legal and social

implications of engineering practices as well as the responsibility of the Engineering in society it prepares you to make informed decisions in your professional career.

*10.5.4..Trade theory ,this focuses on the technical skill and knt requirements in specific engineering trade it often include hand , on training and pratical application of Engineering concepts.

*10.5.4. Industrial electronics this invot the study of electronics systeme used in industrial applications including automation control system ,and robotics sensor , actuator and the integration of electronic systems in manufacturing process.

* 10.5.5Digital system : focused on digital circuit design microcontroller and digital signal processing digital technology is applied variance field .

*Advanced circuit theory : building on basic circuit principle to explore complex circuit network theories and analysis technique.

*10.5.6  Electro magnetic including Maxwell equation wave propagation and field theory which are crucial for  many.

- 10.5.5control system : delving into advanced control theory include feedback system stability analizing and control design techniques.

- 10.5.6electromechanical mechatronics is an exciting interdisciplinary field that comine  mechanical engineerin.

 electronics computer.

-19.5.6  mechatronics systems  systems understanding how mechanical systems integrate with electronics control and software to create intelligent system the include robotics ,Utomation and smart device .

- 10.3.controle systeme learning about the principles of controle electromechanical system loops ,sensor .

*10.4 Design and analysis ,gaining skill in design and e mechatronics focusing on their functionality efficiency.

- computer architecture.

,- 10.5. parallels computing understanding how multiple processors or core work together to perform task more efficiently including concept like parallel algorithms concurrency and synchronisation.

-10.6. computer architecture learnings about the design and organisations of compulator system including CPU memory hierarchy input ./ Output system.

- 10.7. performance evaluation , analysing the performance parallel system including metric .

-10.8 . policy development understands how to create implementation and maintenance policies that govern organisation practice especially in Engineering projects .

-*10.8.  compliance and risk management learning how to ensure that police align with legal and regulatory requirements. As well how to assess and mitigate risk, association with engineering practice.

* Information system exploring how technology management policies documents management system workflow automy data analytics to tract compliance..

* 10.9 .Security systemes , understanding the design and implementation of

system that protect information and asset including cybersecurity measure encryption and secure communication protocol
* 10.10.Safety engineering: learning about principle of designing system that ensure the safety of user and the environment ,including risk assessment hazard analysis ,and safety management systems..
*10.11. defense system : exploring technologie and strategic used in national defense , including surveillance systems threat detection and response mechatronics.
TV radio .
-* 10.1 media frequency : understanding the electromagnetic spectrum and how different frequencies are used for various forms of communication including any and FM radio television broad casting

**Topics ,are**
**- 11. project management : gaining skill in managing electrical construction project including buildings budgeting schedule.**
**\* 11.1 .Entrepreneurs , management design management their .**
**\*11.2. business planning understanding how to create comphrensive business plan that outline goal strategies and financial** projections is crucial for securing funding guiding busiy operation .
* 11.3. projection management learning about tools and techniques for managu project including schedules resource allocation and risk Mt helps entrepreneurs budget.
- financial management : gaming knowledge in managing in managing finance include budgeting accounting analyse this is business decist and ensure profitability.
* Marketing and sales strategies : exploring effects marketing techniques and sale strau to attract and ret custt includes digital e.
*Technology integration , understand how to leverage technology and software solutions to streamline operational improves efficiency.
Low commercial regulation refere to minimal government intervention and oversight in commercial activities
- impact on businesens operation , understanding how low regulation can create armored flexible environment for businesses allowit for easier entry into
**-11.3.-market and dynamics : analysing how regulation effect competition innovation consumer chaise can lead to increased entrepreneurship but also raise can lead ,to increased entrepreneurship but also raise .**

**- 11.4 .legal framework learnings about the legal aspects of commercial regulation including contract trade practice and**

**consumer protection low even low , regulation environment business must navigation countries approach commercial regulation and the . -11.5.implication for internatt** : trade and investment , mining geotechnical engineering is a specialized ,field that focuses on the behaviour of earth material in mining operations.

* Geotechnical analysis: understanding the properties of soil and rock behvot under various conditions this is crucial design .

* Slope stability learn about the analyse and design of slopes in open ,pi mining and undersgroun , excavation to parent landslides.

* Ground support system , exploring the design .

* Global perspective , exploring how different countries approach commercial regut and the impliy for international trade and investment .

* Mining geotechnical engineering is a specialized field that focuses on the behaviour of earth material in geotechnical analyse , understanding the properties of soil and rock material including their strength stability and behaviour under various conditions ,this is crucial for design safe and efficient mining .

* Slope stability : learning about the analysis and ..design of slopes in open mining and underound excavation to prevent land slide and ensure the safety of workers and equipment.

* Ground support systems:.exxplot the design and implementation explore ground support system ,such as Rick bolts shot Crete and mesh to stabilize excavation collapse.

* Environmental considerations: understanding the environmental impact of mining activities and how to mitigate risk associated with with ground .

* Site investigation risks associated with ground .

Site investigation gaining skills in conducting site investigation to assess geological and inform mining design and planing.

- 11.5electrical stability understanding stability of electrical system including voltage stability frequency stability and transient stability this involves analizing how systeme response to distribution and ensuring they can return to stable operating conditions.

-transformer operation including how they step down level in power systems ,you 'll study design effict and perft characteristics.

* 11.6.1Transformer conservation , exploring method method for conserving energy in transformer operational including to, management tools management maintenance,practice and the use of energy efficiency .

*11.6.6 Transformer crucial for reducing losses and improving overall system efficiency.

* Conditt : monitoring gaming knowledge in tech monitory the health and performance of transformer including temperature monitoring insulation testing dusgnostt .

* Spatial Caltrain concept in various fields.

-11.7. spatial control system : understanding how to design implementation control system that montage the position and movement of object in a three dimensional space crucial in application .

* 11.6.Robotic  and automation learning about the principles of controlling robotics system includ kinematics dynamic , exploring how to integration sensor GPS lidar camera into .

12. *Transmission system learning about the design and operation of transmission system for radio and television inclut antennas , modulation technique and signal processing.
*12.1 Broadcasting technologie exploring the technologie used in broadcasting such as satellite communication digital broadcasting and stream.
* 12.2.Sound engineering : understanding the eof accoustict ,inclust sound wave w sound design and audio technology ,includ application in audio engineering noise control and sound system design.
* 12.3.Optic : learning about the behaviour of lights including .
- broadcasting e , exploring the technologie used in broadcasting such as satellite communication digital broadcasting and the princit of accoustict including sound wave progration sound design and audio technology application in audio e noise control  sound system design.
* 12.4. Optics : learning about the behaviour of ligth including reflection refraction and diffraction.you ' ll study optical system lenses mirrors and fibre optic which are essential in various technologies including images systeme .
* Application , exploring how sound and can be integrated into Engineering solutions such imagine ( ultrasound ) optical communication system and sensor technology.
*12.5. Electrical machines: understanding the principles and operations of electric machines including motor generator,and transformers ,you ll learn about their design control and applicat in various industries
* 12.6.Electrotech : this field focusy on the study of electrical system and their components including circuit design power distribution and electrical safety you'll gain knot about the standard and regulations governing electrical installation , electrotechnology this encompasses the applicat of electrical and electronics technologie in various field including automation control system and reneu energy systems explore technology are used to improve efficiency and performance in Engineering applicat.
* 12.7. Radio wave propagation understand how radio wave travel through different engineering environment including factor that affect their range and quality such terroir , wether and frequency .
*12.8; communication system : learning about the design and operation of radio communication system including ,AM ,,FM  and digital radio broadcasting.
* Antenna desii: exploring the principles of antenna theory and design

including different types of antenna and their application in various communication system .

*12.9 signal processing: gainit knowledge in technique for processing and analizing radio signals to improve communication quality and efft.

12.10 . Radiotecht play a cruct role in telecommunication broadcasting and many modern technologies if you many modern technologies.

- random signals understanding the characteristics and analysis of signal that have a random or stochastic nature ,this include studying noise statistically .

- *12.11vibratory signal : learning about signal related to vibration which can be crucial in field like mechanical engineering structural health monitoring and accoustict you 'll study how technology interpretation vibrator signals ,to access the conditt of structural of machinery .

*Application , exploring how both random and vibration my signal are used in various applications such as in telecommunication audio engineering.

*12.12. probability theory: understanding the principles of probability including random variables probabit distribution and the low of large number thesis knowledge is essential for modelling uncertainty engineering systems.

*12.13 statistical methods: learning about about variously statistict technique for data analysis including hypothesis testing regression eand statistics inference ,these methods are to .

*12.14 . building electrical system and materials are essential component in electrical engineering.

- built electrical system: understanding the design installation of electrical system understanding the design installation of electrical system in building includy ligthi power distribution and emergency system you ll about codes and standards that government electrical installation.

12.15.electrical material study the various.material used in electriy system conductor , insulator , semiconductor you explore their property how they affect the performance and safety of electrical system.

*12.16. sustainable practices : learning about energy efficiency design and reneu energy integration in built design and renewable energy integration in building systems include solar power and smart grid .

-*12.17. construction electrical refer to the electrical system and installation that are integral to building.

*12.18. electrical design : understanding how to design electrical system for buit including power distribution ligthning and communication system how to design electrical system for building inclidiy power learn about load calculations circuit design and systeme.

* Installation practt learning about the best practices installation electrical syst in construction.lroject wiring panel installation and safety protot.

* Buit code and standards formiliaring with the local and natit code that government electrical installation in construction.

**13. * Winding on rewinding transformers and machines both DC and AC involves understanding the specification of the windings the types of machine ,and the desired ,**
**13.1.* Understanding the types of machines .* DC machines these include DC motor and generator which typically have -armature windings and field windings.**
**- AC machine : these include ,AC motor** ,like induction synchronous motor and transformser .
-2 key parameters for windings.
a winfmding specifications;
1. Number of turns ( N ) the number of turns in the winding affect the voltage and current characteristics.
2. Wire gauge : the thickness of the wire affect the resistance and current carrying capacity.
3.* Winding configuration Serie parallels combination depending machine type calculating wing parameters.
* For DC machine .
1.calculate the number turns the number of turns can be calculated based on the desired magnetic field strength for DC motor,back EMF($E$)$$E=\frac{\frac{N\cdot\Phi\cdot\cdot Z}{-\rule{3cm}{0.4pt}}}$$
- to calculate aspect related to telephonic cellular telecommunication supply .
-  understanding cellular telecommunication supplies cellular telecommunication supply involves the infrastructure and resource required to provide mobile communication .
* Base station : equipment that connect mobile devices to the network's.
* Backhaul the connection between base station and the core networks.
* Core network the central par of the telecommunication network that manage data and voice traffic
 ,##2* key calculation.
a* coverage area  calculation the coverage ,area of cellular tower can estimate using the following ,$$A=\PI r^2$$
-$A$=coverage area ( in square kilometres)
-$r$=radius of coverage ( in kilometres)
Example : if a tower has a coverage radius of ,5 km
$$A=\pi(5^2)\approx,,78.54\text{ km }^2$$.
b. Capacity calculation: the capacity of cellular network calculated based on the number of channels available ,traffic per channel the Erlang ,B formula is commonly ,$$c=\frac{(A^B).}{.B.}\big/ sum ..$$

* To calculate the component of a cellular telephone system and derive

relevant integral, .

1. Components of a cellular telephone system ,

A: cellular telephone system typicay consist of the components.

* Mobile station ( ms ) * the users device ,smart phone tower that communication with mobile stations.

* Mobile switching centre ,MSC , manages the communication base station and the core networks .

* Core network,handles data routing billing and other ,

## ,2 calculating key metrics.

a.coverage ,Area calculation the coverage area of a base station be estimated using .

$$A=\pi r^2$$

-where .$(A)$= coverage area in square  kilometres .

.$(r)$= radius of coverage in kilometres ,ex : if a base station has a coverage radius of ,3 km .

$$A=\pi (3^2)\approx ,28.27\,\text ,{km} ^2$$

.b capacity calculation.

_____

To calculate the spatial  transmission characteristics of a system particularly in telecommunication.

##/ understanding spatial: transmission, spatial transmission refer to how signal private ,space transmission refer to how signal propagation space ,factor distance obstacle ,and the environment.

* Free space path loss ( fspl ) the loss of signal strength ast travel through free space.

* Multiple path propagation the phenomenon where sign effect : the change in frequency of wave in relation to an observe moving relative to source of the wave .

2 calculating free space path loss ( fspl) the free space path loss can be calculated using .

$$\text \text { fspl } = 20\log - { ,10}{d} 20 \log { 10}(f)+32,44$$ where : $d$ = distance between the transmit and receiver , kilometres ,$(; f)$= frequency of the signal ,in megahertz ,example calculation ,if the distance ,$d ( d )$ is ,10 Kim and the frequency, $( f)$ is ,900MHz ,$[\text ,{ fspl}$

--------------

To calculate the properties of material used and conductor insulator and magnetic material in electrical and stereo ,system ,we can analyse their characteristic.

1. Conductor : are material resistance common conductor..

- resistivity calculation the resistivity,

$((\rho})$ of conductor is a measure of now strongly it resist the flow of electric current the resistance ,

$( (R))$ Of conductor can ,

$$}[ R=\rho \frac { L}{A}$$

.$(R)$= resistance,( ohms ) .

.($\rho$)= Resistivity ( ohm metre )
.(Li)= Length of the conductors meter
./ ( A\)= Cross - sectional area ,saaremeter .
Ex . Calculation for copper wire with a length of ,2 meter and a
cross ,section area of \+|\ mm^2\)
( Which is / ( i\ times ,10 ^{ - 6} , m ^\)) And using the resistivity of copper (
\+\ rho \ approx ., 1,67\ times . 10^ ,=-8},| omega.| Cost m.})) ,
R= 1.68 } times , 10^
To calculate the size of  a winding for stepper motor .
1. Understanding stepper motors.
- a stepper motor is a types of DC motor that decides a full rotation into a
number of equal step winding configuration and size are crucial for the
motor .
* Number of phase : most stepper motor are either ,2 phase ,5 phase..
* Number of steps per revolution ,common value are ,200 steps ,( 1.8 degree
per step or ,400 steps ( 0.9 degree per sleep .
* Windt configuration the arrangement winding unipolar wire gauge : the
thickness of wire used for the winding effects resistance ,
3. Calculating the size of the winding : determine the number of turns s , the
number of turns in each winding ,calculated based motor specifications : for
example ,\[ N= \ frac { v} { L csoti }\ ]

**\*1 types of measure errors measure : systematic these are**
**considering repeatabt errors that occurred measurements system**
**they**.
*Random error unpredictable and can vary from one measure.
- gross errors : the are large errors that occure to human .
* Calibration of instruments ,calibrat is the process of adjusting instrument
to ensure its measure are accurate step  for calibration.
1. Select a standard: use a reference standard.
2. Measure with the instrument take measures using the instrument.
3. Compare measurements , compare the instruments .
4. Calculate errors the errors can \[text { text error }= text { measured
values \ text { true value } \]
5. Adjust the instrument if system error are found adjust .
- to perform conversion between binary hexadecimal.
Conversion between number systeme.
* To convert a binary number to decimal ,use the formuler , \ [\ text
{ Decima} = sun -{ I= 0}^{n}b-1\colot 2^i/] ,where \(b_1\) is the binary
digital ( 00r1) and \(n\) is the position of the difit from the rigth starting at 0
convert ,\ ( 1011_21) to decimal \ [ = 1\ colot ,2^) to decimal \[= 1\

colot ,2^3+0\ colotv,2^2+1\ CDOT,
2^1+1\ colot ,2^O= 8+0+2+1=11_{10}\]
-decimal to binary : to convert a decimal number to binary divide the
number by ,2 and record the remainder , repeat until the Quotient  record
the remainder ,repeat until the Quotient is ,On
Exp : convert \ ( 1@-{10}\) to binary .
\ [ 11\div ,2=5\ qual\ text { remainder ,r= \\ ,5 \ div ,2=2\
-to calculate the size of a memory accumulator in a binary system.
1) understanding binary representation:
In a binary system ,data is represented using bits ,binary digital where bit
can  either 00r,1 the number determine the range ,of value that can store .
2. Memory size calculation : the size a memory accumulator based number
of bit it the total number of unique represented by an \(n\) bit binary number
.
\ [ text { number of values } = 2^n\]
Where . \(n\)= numbers of bits.
* Example calculation: determine the size of the accumulation.
2) calculate the number of value ,\[\ text { number of values }= 2^ 8  =
256\]
This mean the accumulator can hold values from \ (01) to (255\)
( decimal ,### memory size in bytes * memory size is of expressed in byte
since ,1 byte = 8 bit ,size of the accumulator in bytes is \ [ text , { sizer

_____

To calculate thevenin  , equivalent of a network ,short circuit current and
voltage value ,
1. Thevenin theorem.
* Overview: thevenin theorem state that any linear Electrical net with
voltage source and resistance can be  replaced by an equivalent circuit
consisting of single voltage source ( 1(V-{the}\)) in series with with a single
resistor ( \ (R-{ the}\)).
2. Step to find the in equivalent.
## a identify the portion of the circuit select the portion the circuit for
which
b calculate thevening voltage ( \( V - ( the }\))
1.open - circuit voltage, calculate the voltage across the terminal where the
load was connected this is the thevenin voltage (\(V-*{the}\))
-2 method : you voltage division nodal analysing
- calculate thevenin resistance (\(R-{the}\))
- deactivated all independent source : replace independent field.
- to calculate amplification in circuits involving diodes transmission diode
transistor ,and triacs understand each a analyse characteristics.
# diode amplification diode are typically not used for amplification in the
Sens performance signal modulation rectification signal signal modulation
rectification diode current calculation.
\[I-D= L.S \ left ( e^{\ frac { V-D}{ NV - T}} -1 rigth .
. \(1-D\)= diode current (A).

. $(I-S)$ = reverse saturation current.

. $(V-D)$ = voltage across the diode ,V

. $(n)$ = ideality factor ( typical between ,1 and ,2

. $( V-T)$ = thermal voltage ($\approx 26\ MV$ ) at room .

2. Transistor application transistor can use common collector thermostat common ,is common emitter amplifier .

1. Voltage gain ( $( A-C)$ )$[A-V=$

_____

To analyse and calculate parameter in a control system we typically focus on aspect such systems stability response.
'''''''
___

2. Basic concepts in controle systeme.

* Open - loop control system : systeme that does not use feedback to determine if it's output has achieved the desired goal .

* Closed loop control system systeme that uses feedback to compare the actual output to the desired output.

,2 transfer function

The transfer function.

The transfer function $(H(S))$ of a control system relates the output ( V( s)$\<$) to the input *$(x,(s))$ in the Laplace domain : $[ H(s)= \frac { y(s)}{x(s)}$

3. Stability analysis , to determine the stability of a control system we can use the characteristics equation derivative the transfer function the characteristics equation is obtained by setting the denominator of the transfer function to zero

- for a transfer functions , $[H(S)=\frac {k}{S^2+3S+2}\]$

The characteristics equation is .

$[S^2+3s+2=0\]$ to find the root we can use ,

$S=\frac {-b\pm \start ,{ b^ 2-4ac}}{2a}$

1. DC machines : speed ( n ) the speed of DC motor can be calculated using formula $[N=\frac { V-1\CDOT -R}{ CDOT \Phi }\]$

- where $( N\)$ = speed in Rpm ( revolution perminute .

- $( N\)$ = supply voltage ( v ) ,

-$(i\)$ = armature current (A)

$( R\)$ = armature resistance ,( ohm .

$(K\)$ = a constant that depends on .

. $(\Phi)$ = flux per pole ,(WB)

b ,torque ,( T) ,the torque procedure by DC .

T= k $\CDOT }$ phi $\CDOT \]$ ,

Where .

. $(T\)$ = torque ,( N.m)

$(k\)$ = A constant that depends .

$( phi)$= flux per pole WB .
$(|)$= armature current .

To calculate de gradient of a function and derive the integral of a Senegal,
1. Calculating the gradient of a function
The gradient of a function $( f(x,y))$ is a vector that contains all of its partial derivatives for a functionalite of two variables the gradient is given.
$[ \nabka , f=\ ,\left(\fract { \partial f ) {\ partial x } , \ frac \ partial f }\ partial y \ right.$
f( x,y) = x^2+x^2]
.step ,1 calculate the partial derivatives.
.$(\ frac {\ partial f}{ \ partial x }=2x )$
.$(\ frac {\ partial f }{\ partial y}= 2y , I)$
. Step 2: write the gradient $[\nabla ,f =2x,2y)]$
# 2. Deriving the integral of a signal ,we typically,use the fundamental theorem of calculus ,if we have a continuous function $( f(t,,))$ the integral from $(a)$to $(b)$
Is given by : $[\ into$a^ b f( f) \,dt]$
-
To calculate derivation ,both partial total double ,triple, relate ,to signal detection.
1. Partial derivatives : partial derivatives are used dealing with functionalite of multiple variable , for a functionalite.
$(f(x,y))$ the partial derivatives with respect to $(x)$
Is denoted as $(\ frac{\ partial f }{ partial x})$ and with ,
Respect to $( y)$ as $(\ frac {\ partial f }{\ partial ,y })$
Examp : $[ funct [ f( x,y)=x^2y+3xy^3]$
* Calculate partial derivatives .$(\ frac \ partial f ){ partial ,x }= 2xy+3y^2)$
.$(\ fract \ partial ,f }{ partial y }{= x^2+6x6xy)$
* Total derivatives : the total derivatives account how a functionalite change with respect to all it variable.for a functionalite.
$( f(x,y))$, the total derivatives $ ( DF )$ is given by : $[ DF = \ frac { \ partial f }{\ partial x }sx +\ frac{ \ partial }{ \ partial y } St \ ]$
Using the previous : $ [ DF = 2xy+ 2y^2)$

- to calculate the Laplace and Fourier series Fourier a random vibrational signal ,signal aleatoire vibratoire in the context break down into a few steps.
1. Fourier series : the Fourier series and cosine function for periodic function $ ( ft))$ with period ( t) the Fourier series is.
f(t)= a 0+\ sum ${n= 1}{\ infty}$
$\ left + a_ n \ cos \ left \ left + } frac { 2\ pi not }{T}$
$\ right ) + b _ n \ sunleft ( \ track { 2\2 Pu ,not { T}\, \ rigth \ rigth )]$
- pratical exercise related to electrical engineering
Exercises calculate the total resistance in a circuit problem statement have ,3 resistance.
Resistor ,R1= 100 ohm resistor ,R2= 20 ohm , resistor ,R3= 309 ohm

Formula for total resistance.
$$R_{\text{total}} = R1+R2+R3$$
. Substituting the values $R_{\text{total}} = 10\text{ ohms} + 20\text{ ohms}+30\text{ ohms}$, calculating , $R_{\text{total}} = 60\text{ ohm}$

--------------

- to calculate the supply trade theoty impedance and resonance in a electrical circuit ,we typically deal with RLC ,( resistant inductor , overview ; of impedance and resonance.
1. Impedance ,Z in a RLC circuit the total impedance is combination of resistance ,( R ) inductive reactance ,x l and capacitive reactance ,( x- c ) the formula for impedance in a series RLC ,circuit is
$$Z =\sqrt{R^2+(x-L-X_C)^2}$$
Where $x_L = 2\pi f L$ Pi .f.c} ( capacitive reactance ,
-$X_C=\frac{1}{2\pi.f.c}$( capacitive reactance.
-|(fI) is the frequency in Hertz ( z)
-$(L/)$ is the inductance in Hertz ( Hz ) ,
| ( L /) Is the inductance in  Henry( h)
-$( cl )$ is the capacitance in farad ( f )
2* resonance occurred in an RLC circuit when the inductive reactance equals the capacitive  reactance ( $( X_L= X_C)$ at resonance the impedance is purely resistive and the formulation for resonance  frequency form resonance frequency ( $( f - I))$ is
To the calculate the  fundamental system electric power factor we need to understand relationship between real power reactive power and apparent power in electrical how to define.
1 .real power ,P owner reactive power and apparent power in electrical how to to definition real power the actual power consumed by the load measure in watt ,w
2) reactive power ,q the power the oscillator between the source and the load measured in volt amperage reactive ,varv
3 ,apparent power ,s the total power in the circuit , measure volt ampere ,Va is the combination a real and reactive power ,
- power factor calculation:
The power factor ,of is defined as the ratio of real power to apparent power ,
$$\text power factor ,of )} =\frac{P}{s}$$
Where : .$(P)=$ real power ( w)
.$(S\\)=$ apparent power ,( VA)
## apparent power calculation




# apparent power calculay the apprent power can be calculated using the following formula .
$$S=\sqt{P^2+Q^2}$$

.value .real power ($P$)=500w,
.reactive power($Q$))=300VAR
- calculate apparent power ( s)\[,S=\sqt{P^2t
- to calculate the characteristics of AC and DC machine we typically look at paramt such a peed torque and electromotive force ,( EMF) calculate these , Characteristics for both type machines .
-where .
$|(a-O=| \frac {1}{T} int- 0^ f(t)\dt)$
$.\+a-n = \frac {2}{T} int\_O^Y f ( t) \cos\ left ( \ \frac { 2\ Pi .n t}{ t } rigth \,$
DT have simple square wave function.

---

- to calculate the transformation and conservation of signal in the context of electrical signal we.
1 .signal transformation Fourier transform.
- the Fourier transform is used to convert a time domain signal into it frequency domain represent formula : transform $\ F ( \ omega )$( of a continuous signal \( f(t) , e^{- j \ omega }\ dt\]
- where . $( f+ \ omega )$ = Fourier transform of the signal.
.$( f( t )$= time - domain signal .
.$ ( \ omega )$ = angular frequency in Radia per second ..$ ( j)$ = imaginary unit .
BB* Laplace transform
- the la place trans is another transformation used to analyse linear time _ invariant system formula for the la place transform \ F( S)\) of function \ ( f(t)\) is \[f(s)=\ into -{O} infty } ,  f( t ) ,, e{-st } St \]
- $( f( s)$= Laplace transform of the signal .
- \ f( ft c)I)= time domain signal.

---

- to calculate and understand synchroun and synchronous system, particularly in context of linearization .
1. Synchronous systems.
- in a coordinated, governed a common clock signal , in electrical synchronise system are used in digital circuit and communication system.
- example : lineare system the state  space representatation .
\|[ | \dot { x}(t)=Ax(t)+By(t)\]\][y(t)=(x(t)+du(t)\]
Where :
-$|(x(t)$= state vector
.$|(u(t)$= Input vector
.$ (y( t) )$= output vector .
.$(A)$= System .
.$(B)$= input matrix .
.$|(C)$ = Output matrix .
.$( D )$ = feed forward.

---

2.asynchronous system as asynchronous system operate without a global click signal operate independently and may not be synchronised this

common in certain types of digital circuit and communication system .
- example equation for an asynchronous ,for an asynchronous linear systems the state space representatation .
$[| Dot \{ x\} ( t\}= Ax ( t ) + B( t ) \ ]\[y(t).$

_____&
To calculate the integral of an amplified signal , detection of a signal and the probability of a radon signal aleatoire.

Integral of plidie signal

If you have a signal $\ f( t)\)$ that is amplified by a constant factor $\(A\)$ the amplifier signal can ,be represented as $\( af ( f(t)\)$. The integral of this amplified signal over a time interval $\[a,b])\[\ int_ a^baf( t)\, St = A\ into _ a^ b ,f ( t) \ St$

Exampt say $\ f( t) = t ^ 2\)$ and $\( A= 2\)$ we want to calculate the integral from $\ ( 0\)$ to $\ ( 1 \}):$

$$\[\ into _0^/2t^\, St = 2\ in_ 0^ t^2\,dt\]$$

Calculating the integral

$\[ into 0^1t 2^2\,St=\ left[ \ fract \{ t^3\}\{3\}\ rigth ]-0^1=\$
$Frac \{1^3\}\{3\}_\ frac \{ 0^ 3\}\{3\}=\ frac \{ 1\}\{3\}\\}$
Thus $\[ \ into _ 0^ 1 ,2 T ^ 2\,dr..$

_____
To  calculate or design a program for artificial intelligence ,AL within an operational framework we can outline the key component and steps involved .

Program
- 1 define the operational framework : an operational framework for an all program typically includes the following components.
* Objective : clearly defined the purpose of the Al program classification predict optimisation
* Data source : identify the data source requirements for training and testing the Al model database ,APU real time data ,
* Algorithm : choose the appropriate Al algorithm based on the problem type ,supervised learning , unsupervised learning reinforced
1. Data collection and preprot
Data collection gather data from identified source this could involve wab departing using APIs or accessing database.
* Data cleaning : remove duplicate handle missing value and correct inconsistent in the data.
* Feature ent : select and transfy relevant feat that will be used in the modej .
3* model development.
* Select model choose the AI model based on the problem type for .
- for classification decision tree random ,forest ,support vector ,machine ,neural networks.
-* for regression linear regression polynomial regression neural networks .
- training train  model using the  data set .
- to calculate a physical chemical plant balance we typically use the

principles of mass and energy balance this,involves accounting for all input out son, accumulation of material and energy systems.structure approach to performing a mass balance physical chemical process .

2 define system : identify the boundaries of the system your are analizing this could be reactor distillation column any other unit operation in a chemical plan .

3. Identify input and output : list all the input and output system ,input can include raw material solve energy source while output / and was

-

14*. Mass balance equation : the general mass balance equation can expressed as :

$$\text{ input }-\text{ output }+\{ generation \} \text{  consumption}=\text{ accumulation }$$

- for a steady state process ( where accumulation is zero the equation simplified to $$\text{ input}\text{ output}\tezt Generation}-\text{ consumption}=$$

4.example calculation consider a simple chemical reactions input : A= 100kg / h , B =50 kg /h ,output ,,C= 120kg /h ..

.product..

14.1 to calculate the derivative and integral related an electromechanical systems we typically analysis the system behaviour using differential equations that describes the dynamic of the system structure approach to derive the master equation and performance the necessary.

14.1. master  derivatives : electrical derivatives for a simple electrical circuit with an induction ,$(L)$ and  a resistor $( R/$ the  voltage across the inductance can be by : $$ V-L \{ L\ frac \{Di\}\{St\}$$

Where $( v-L)$= voltage accross the inductor.

.$(|\)\{$ current through the inductor .

- b mechanical derivatives:for a mechanical system the relationship between torque $( \tau)$ and angular velocity $(\ omega \)$ can be described by .

$$\ you = |/ frac \{ d\ omega \}\{ St\}$$

- where .$( \ tau)$ = torque.

$\ (\\)$= moment of inertia

$(\ omega \ )$ = angular velocity master

14.2 definition: isostatic system a system that hasjus enough support to maintain equilibrium without any redundantly it has exactly as many constraints as necessary

- hyperstatic for equilibrium leading to redundancy in constraint.

\* Stability : refers to the ability of a system to return to its  original state after disturbance.

\* Stability analysis: for stability analysis ,we typically use method. Eingenvalue  analysis for a system represented by a matrix the eingenvalue can indicate stability ,if all aigenvalue have negative real part  the involved finding a lyapunov ,( function $\(V(x)\)$ , such that $\(V(X)>0\)$ and ,,$\(\dot{(V)(X)<O\)$ for stability.

14.4 transformation to linear system to transform a hyperstatic system into a linear system , we can use the following step , modelling a motion ..

14.6 creating a programme for a artificial intelligence ,AI , system that focuses on operational metering in electric system involves several steps , including defining the object design the architecture implementation . Algor designed the architecture implementation algoris below .

- 1 define objective
- purpose : the AI system should monitoring analyse and Optimizer electric metering operations.

14.7.

Key features:.
- real time data collection from electric meter .
- data analysis for consumption patterns.
- anomaly detection for identifying irregularity.
- predictive maintenance for meter reporting and visualisation of data.

14.8. system architecture:.data source electric meter and sensor ,Day ,SQL no sQL ) to store historical data .

\* Processing layer , implement data processing and analysis using AI algorithm.

\* User interface  development a dashboard for user to visualisation data and insights.

\* Data collection / use API ,,direct connection to gather data from electric meters,example  shifter for data collection ,( python)

\* Python,import request,def ,collect meter dentK meter data storage.
- r esponse request get ,( f" http:// API electricity meter comparable ,/
{ meter _ I'd  "} return response .jsob ( )

14.9.Creating on expert system for network involved several steps . <
Including defining the objective designed the architecture. Implementating the algorithm below is a structure approach to developing.

-\* define objective :
Purpose .the expert system shouand ld assist in network management troubleshooting and optimisation.

\* Key features: network monitoring and performance analysis troubleshooting and diagnostic capabilities.

- recommendations for network configuration.
User friendly interface for networking administratir.
2. System architecture , knowledge base a repository of network knowledge
including rules ,fact and heir interference engine the core Logica knowledge
base derive,user interface

- implementation step : knowledge base developm.protocols configuration
common issues and solutions
-plain text .
If network _speed < threshold
Then
If packet _ loss >
Acceptable _ level then
Recommended _ check _ hardware.
- inference Engine implement the inference Engine to process user queries
and apply the rules from  from the knowledge base.
Ex code snippet , python.
Python
Class expert system
Def _ initi_ self
Self . knowledge base
- to  analyse a pneumatic hydraulic vibratory system equation governing the
system and performance integrals
1. Understanding the system ,A pneumatic - hydraulic
Vibrator system typically consist of
* Pneumatic components : air driven actuator or cylinder.
* Hydraulic components : fluid driven actuator or cycle

to
16.hydraulic components:fluid driver actuator or cylinder .
* Vibratory mechanism , A system that produces oscillator or vibration, oft
used in applications like material.
2 . deriving equation for a pneumatic hydraulic system the dynamic
described using Newton second low and the principles of fluid mechanics
_1 force balance the net force acting on the system,express as $F-{\text { net }}=F-{\ text { pneumatic}}++$ ,
$F-{\text { hydraulic }}-$ , $F {\ text { damping }}-F{\ text ( inertial }}$
2.* Pneumatic force .the force generated by a pneumatic actuator.

To derive the relationship force ,motion. ,power ,energy .
$[F= m\ CDOT a \ ]$ where.
$.\(F\) =$ force ( N) , $| \ ( m \)=$ mass ( kg ) $|\(a)=$ acceleration ,( m/s.s)
* Work done by a force : work ( $\(w\)$ is defined as the force applied to an

object time distance ($d$) over which the force
Is applied in the direction force .
$$ W= F \cdot d \cdot \cos( \theta $$
.$(w)$= work ,joule
.$( f)$= force ,N
.$(d)$= Distance,m
.$(\theta ) $ = angle between .

,3 energy :
Kinetic energy ,( k.E) is the energy of an object du it's motion .
$$K.E= \frac {I}{2}.m.V^2.$$
Where .
$(V)$= velocity ( m/s)..to analizing the concept of magnetic electromagnet
and electrodynamics,system in relation silence ,or damping and solenoids

_____
- understanding the concept.
- solenoid ,a coil of wire generate a magnetic field an electrical current pass
through it.
* Magnetic moment ,A measure of the strength and director of a magnetic
source
* Electromagnetic induction , a measure of the strength and direction of a
magnetic source .
* Electromagnetic.iduction .the process by changing magnetic.field induce
and electromotive force ,EMF ,in a conductor .
* Electocinectic ; refer to the motion of charged | particle a fluid under the
inference of an electric field  magnetic moment of solenoid..- the magnetic of
solenoid.
-the magnetic moment ($m$) of a solenoid, $$ m=n\cdot \cdot A $$
Where . $+Cn)$= number of turns per unit length ,turns / m
$()$= current throughout the solenoid ,A
$(A)$ = cross - sectional area of the solenoid,mm. Electromagnetic induction
- according to Faraday los electromagnetic the induce

_____
16.3.The term Quotient intellectual calculus is term in mathematics or
intellectual ass.
- intellectual Quotient ,( iQ) ,the ,IQ is a measure of a personal intellectual
abilities in relation to standardise test that assess various  cognitive skill .
- IQ $$ \text {IA}=\left (\frac { text { mental age }}{\text { chronological
age }}\right ) \time ,100$$

- mental age : the age level at which a person perform intellectual.
- chronological age : the actual >
2.Quotient in calculus.
If you have two function $( f(x)$ and $(g(x))$.the quotient $$ A(X)=\frac {f(x)}{g(x)}$$

3.calxukating the derivative of a quotient , [ fract = d}{dx{\ left ( \ fract { f ( x) }{g(x)\ rigth )

_____
- to analyse psychometric variance ,variance in electrical psychometric field of study concerned with theory of psychopedagogie measurements knowledge ability attides and personality traits in this psychometric test analysed staatiscally ..
2. Calculating variance is statistics measure that represent the degree of spread in set of value in the of electrical measurements.for variance : the variance $(\sigma^2)$ of a set of values $(x_1,x_2 \text{ isots} ,x_n)$ is calculated using formula
€[| sigma ^2= \ frac { 1}{n}\ sum _ {I=1}^{x_i\ mu )^2\]
- $(\sigma^2)$= variance
.$(X_1)$ = Each inductive . observations
- formulation

_____
In electrical engineering under is crucial for analyse data especially.
1) variance : measure how a set of value differ from the mean of set it quantite the spread of the data paint .
-for a set of $(n)$ observt it quantt the spread of the data .
Point formula for variance.
For a set of $(n)$ observations $(x_1,x_2, \text{ isots} ,x_n )$
|[| Sigma ^2=\ frac {1}{n} sum_ {I=1}^{n}(x_1-\mu)^2
Where.$(\sigma^2))$= variance.
.$(n)$= number of observations .
.$(xi)$= each individual observation .
.$(| mu)$= mean of thicd ..
---\[|my= \ frac {1}{n} sum _ { I= 1}{n}, x _1\]


_____
2.covariance measure the degree to which two the degree to which two random variables change together indicate the direction of the linear relationship between the variable : { foetus set of observations \ (x=(x_1,x-2\ dot ,x_ n )\) and \ + y= ( y-@,y-2,\ idots ,y-n

3. Calcul the electrical installation requirements for a building term .
- understanding power and energy .
* Power ,O * measure in kilowatt ( kW ) it represent the rate at which electrical energy is consumt products .
* Energy ,( E) : measured in kilowatt hour ,kWh it represents.
.\[ E= O\ times \ ]
.$(E)$= energy in kWh
.$( P)$= power in kW
.$( t)$ = time in hours .
- 2 calculating total power demand to calculate the total power for a

building.

- list of electrical load ligthning ,10 fixtures a ,15 watt each ,HVAC : 3 kW , appliances ,2 kW other equipment ,1 kW ..
2 calculate total power demand ligthning \(10\ text{ fixtures \ times

- defensive scope process , applicability
Claim system
Thesis
Overview; education trade
Key

-brigades vs private security public safety police goverment student police army order public police CA safety ,vs student portofy police metropolitan student student case government thermie vs securite gov study .
-* overview ,key topics prospectus university operational task requirements criteria college university natural summarise key trade abstract phylosophie concept trade concept definitely extension trade and understand trade design comphrensive trade design comphrensive trade concept vs trade theory college requirements basic task construction partie trade explanation low rules university trade overview idea univer , industrial thesis work undragogie concept.
* Applied trade to resolve trade, applied sciences  math work operational applied vocational national framework  sciences math work operational applied continue university institute trade low rules.
- key , overview abstract trade concept trade theory electric conception ,idea phylosophie education trade undragogie idea axiom argument resonement univer summary application vs college scope.

- trade submission mission applied trade to supply.
- abstraction , metaphysical metaform transformer trade university vs College purpose that requirements basic principle installation that career vs university.
- Vs e cpd diploma trade continue Scotland continue diploma trade certificate master degree construction master degree , professional supplemtaire continue vs diploma graduate continue integration and master degree short not professional skills development degree discovery career center master tlc technical learner college diploma and master degree diploma building electrical master businesses please can see satellite, combination cpd training job the don't want to vocational cashier and ncv and relate ,and hr w.
* Distance learning courses is for people don't have time no distance learning is for people have time credit distance the  do authority thing don't have class place I your things after thing the teach university e.
- work distance home programme workplace place the is not space to make things .
- research master degree engineering electrical trade CVS in research master degree Education technologie cad Education technologie not education master degree ,AIU not outcom engineering electrical.
+Framework saqa engineering is not Education technologie Education technic pedagogie career AIU Education Microsoft one note
-esucation technology circulum educator framework educator week modules years subject technology fundamental power education phenomenology AIU no allowed Master stability static education degree no stability static engineering creation linear stability in education trade.
- technical matric and education technology trade ncv matric educator.
- technologie manufacture research not Engineering matric engineering trade CVS .
- lecture facilitator trainer moderator assessor career education technology after di master engineering thesis degree Honore must complete master degree educator technic form thesis TVET and
- the master trade technologie and master master education technology are Cree humanity orientation cycle technologie creation humanity didn't overview concept  humain key humanity
- technologies engineering humain vocational technical phase master humanity and component.
-is degree Batchelor is degree honorable master translate Sens possible appoint n engineering and Education in labour Education relation labour in security defense posted for understanding university undergraduate work sars sarb level master Eaton Scheineder master principle engineering engineering 12 years staff master ,12 years the appoint seniore training power city the appointment .
12 years experience job duty if the train senior advance technology you pass if not must work orientation TVET or master ,2 years .
- 12 years stables office work engineering power trade sign report draw

design ups building is no stable is there building everyday,only one building the trade lay is not master office road is notaster office road public work stability

- have 1000 building new installation ,100 building city japon China ,100 entrepreneurship author chine in Congo e,3 years after years wiring engineering ,1000building USA rebuild computer wiring ,1000 architecture.
-------
12 years experience cadet minim junior senior semmester experiemental duty training college and job trade drilling foreman experiemental after ejunior engineering staff engineering engineering engineering staff engineering job cpd engineering categories engineering cadet ,grade ,12 N1 junior level ecoxustrure Microsoft training cadet function duty grade,A,B,C,d job in your trade e ,N1,N2,N3,N4,N5,N6, subject module experiemental duty editing type career transmission generation power do it trainer do saps duty office doing cpd ,doing type career doing transmission generation power do it trainer do saps operation power do in your thesis advance field diploma do it seniore and principal engineering director duty core ,b

to
1. Overview v: school money make is budget academic voting wordsr asssessment order book copyrt order salary pay sleeping salary base shift teacher lecture learn auditing years pay bonus lesson from ,100 rand per day day shifting ,2500 rand salary wage bonus annual ,× 12 month over e extra class teacher in lecture assessor moderator granted primary,6 teacher high School ,12 teacher subject n2 to ,n 6 six lecture if double shift teacher and lecture rand house home air time water,× 100 rand ,× 30,3000 ×9000+900 water water = 18000 rand class per month grade ,10×800, rand  800×6 = 400000×12= 48000000 rand ,pay government returned tax , Amandment .
- bank account school have ,200000 rand account school ,2000000 estimate budget  and money granted award now compliance ,5 5000 rand by school desk chaire desk  panel wiring buyer ,poy Ccma labour court award ,bank school teacher e to Ccma t seta casebook , money school pay is not for boss is school ,pay  money school pay is not for boss is school pay money school make arrested irregularity .
- school fee policy arrested report didn't pay search exhibition years proof ecourse subjt no record books ,till point policy ,
- pay granted settlement arrange demage interested court pay complain pay case order pay review transct payment irregularity payment judge made aware money assesment order book judge pay the pay granted skill development levy bargaining.
Uif

H

- uif labour pay agreement settlement policy sector intelligence assessment order debator creditor minister gov docket Portofilio minister pay sector mutual iirregularity development rural pay sector sector irregularity development rural pay non register pay irregularite course nated aware Education sector dismissed does meet pay sector skill development legislation notice rural chaine supply bid scope annuel delivery.
- development pay aware compensation labour infrastructure development building docket public minister sector building rebuild case development sector dhet non existence NN diploma regulation irregularity non existent record ucpd land reform patliema Sita project development computer pay granted docket project sector area village algorigram mining sector implementation.
Development rural skill award fund UNESCO find UNICEF Ong non governmental fund child abandoned child rebell integration by fund programme accompting ongd educator teach tableaux dimensions industrial refused to complete process industries social security refused that teacher development rural the teacher if accepted product is successful
- Education developm child workers domestic phase homes no certificate sum irregularity fund promotion take a project make tools remanufactured and take people support those ring irregularity police take project aware certificate compliance,1000 computer , 1000 badge ,10000

Experience theoretical pratical in requirements trade theory engineering subject certificate experiemental certificate issue Eaton career assessment academic question experiemental profile in answering questions duty project customer scheneider training certificate experiemental question got 50%,40% engineering Alison cpd experiemental answer retake experiemental career city power power over letter format Portofilio link answer assessment Microsoft NN diploma in grade minimum junior pass training project experiemental aware material increase project case support Microsoft experiemental days license trade marks police met data trailblazer algorithms IP license book experiemental.
- compliance week trainer practice customer record instruction bulletin Eaton installation week long answer buy trade in plant customer sale Eaton Scheineder modicon Relais instruction customer microstf customer money answer trade filling appreciate job is week customer sale Eaton make modicon didn't come RSA customer Microsoft dynamics sale make find

training it is secret career didn't show is the place permitted can enter where the make those components accept you make a project with and watch zone 52 scope volant Microsoft ,10000 badge key gate office didn't see wath the doing retirement license trade traiblazet,2000!the make difference country plastic dra